

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) Process for the automatic rectification of images, wherein ~~at least one~~ an image is rectified by a mapping function onto a reference image (R), and at least some parameters of the mapping function are unknown, said process comprising ~~at least:~~

~~an extraction of~~ extracting at least three objects (O1-O3) from the image (O);

~~a determination of~~ determining at least three control points in the image, ~~where~~ such that characteristic object points of the extracted objects are determined as control points;

~~an assignment of~~ assigning the objects (O1-O3) to objects (O1'-O3') in the reference image, ~~where the objects in the two images are assigned on the basis of the~~ such that assignment is made according to similarity between ~~the~~ corresponding objects in the two images and/or on the basis of a vector grid, ~~and the vector grid is formed by the connections between the~~ characteristic object points; and

~~a selection of~~ selecting one of a suitable mapping function and ~~and/or an~~ adjustment of the adjusting parameters of the mapping function, whereby the mapping function is changed by changing the parameters in such a way that the cumulative error in the positional differences between ~~the projected~~ control points and ~~the~~ corresponding points in the reference image is minimized.

2. (currently amended) Process according to claim 1, further comprising ~~the generation of:~~

generating weighted control points, ~~where~~ for forming a control point structure, comprising a limited number of pixels, ~~is formed~~ around a control point of at least one of the image and ~~and/or of~~ the reference image; and

projecting the control point structure, using ~~is projected by~~ the mapping function, onto the ~~other~~ image serving as the image structure ~~so that it can be seen~~ for determining whether there is also a corresponding image structure of sufficient quality ~~there as well, where a~~ , wherein

the quality of the control point structure is described measured by at least ~~in terms of~~ one of its variability, directional contrast, and/or similarity, and a weighting of the control points is ~~determined~~ on the basis of this said control point structure quality.

3. (currently amended) Process according to claim 2, further comprising:
~~an adjustment of the~~ adjusting a position of the control point in at least one of the image and ~~and/or in the reference image, where;~~

adjusting, for at least one channel, ~~the form of a control point structure~~ gray-scale value distribution ~~of the control point structure form~~ in the reference image, ~~and the form of the a control point structure~~ gray-scale value distribution form of the image structure in the image ~~are adjusted~~ , to each other;

determining, whereby, in at least one of the image and ~~and/or in the reference image, whether there is~~ at least one first difference between the gray-scale values of two adjacent pixels of the control point structure and at least one second difference between gray-scale values of the corresponding pixels in the image structure ~~is found~~ ;

determining an error value ~~being derived from the a difference between these two said first and second differences, with the;~~

mapping a less-resolved image structure component ~~being mapped onto the a more highly resolved image structure component, with ; and~~

shifting the control point structure in at least one of the image and ~~and/or in the reference image being shifted~~ , in the at least one of a vertical and ~~and/or a horizontal direction, to determine the error for the a new position error.~~

4. (currently amended) Process according to claim 2 ~~or Claim 3~~, further comprising an adjustment of the parameters adjusting at least one of individual parameters of the mapping function and ~~and/or~~ a selection of a suitable mapping function, ~~where such that a change of the mapping function is changed made by changing the parameters said adjusting in such a way that the a cumulative error of the positional differences between projected control points and the corresponding weighted control points in the reference image is minimized under consideration of the weighting of the control points.~~

5. (currently amended) Process according to ~~one of Claims 1-4~~ claim 1, further comprising performing a compensating calculation ~~by means of using~~ a correction function, wherein, for at least two control points, at least one vertical and one horizontal correction value is determined, ~~which embody the~~ said correction values correcting for positional difference between ~~the~~ a projected control point and ~~the~~ a corresponding control point in the reference image, and wherein the correction function is determined as a function of the correction values.

6. (currently amended) Process according to claim 5, further comprising a ~~projection of the~~ projecting corner coordinates of an image element onto image positions, wherein ~~the~~ image positions of the corner coordinates are determined ~~on the basis of~~ from the mapping function and the correction function.

7. (currently amended) Process according to claim 6, further comprising:
performing a resampling, wherein ~~the~~ corner coordinates ~~mark out~~ describe a polygon, ~~preferably a rectangle~~, and
the gray-scale values enter into the final gray-scale value in correspondence with ~~the~~ a percentage of areas of all ~~the~~ image elements lying within the polygon.

8. (currently amended) Process according to ~~one of Claims 1-7~~ claim 1, characterized in that ~~the~~ said step of extracting ~~extraction~~ comprises performing at least one of a classification and ~~and/or~~ a geometric structure analysis, ~~wherein in the~~ said process further comprising:

~~classification~~, analyzing the properties of the image ~~are analyzed~~, and forming at least one of objects and ~~and/or~~ areas of ~~the same~~ like classifications ~~class membership are formed, if classification is performed~~; and

if in the geometric structure analysis is performed, the determining an edge contour of an object ~~is determined on the basis of the~~ from contours of an area, ~~and/or and~~

numerically characterizing the objects are ~~characterized numerically by means of~~ a structure index.

9. (currently amended) Device for ~~the~~ automatic rectification of images, wherein ~~at least one an image can be rectified~~ is rectifiable by a mapping function onto a reference image (R), and at least some ~~of the~~ parameters of the mapping function are unknown, said device comprising at least:

a an extraction module (1, 2) for extracting at least three objects (O1-O3) from the image (O);

a control point determination module (3) for determining at least three control points in the image, wherein characteristic points of the extracted objects ~~can be~~ are determined as control points;

a an object assignment module (4) for assigning the objects (O1-O3) to the objects (O1'-O3') in the reference image, ~~where~~ such that a correspondence between the objects in the two images is established ~~on the basis of the~~ according to at least one of similarity between objects and ~~and/or on the basis of~~ a vector grid, ~~the vector grid being~~ formed by connecting characteristic object points; and

a selection module for at least one of selecting a suitable mapping function ~~and/or~~ ~~for~~ and adjusting the parameters of the mapping function, whereby the mapping function is changed by changing the parameters in such a way that ~~the~~ cumulative error in the positional differences between ~~the projected~~ control points and ~~the~~ corresponding points in the reference image is minimized.

10. (currently amended) Device according to claim 9, further comprising a module (6) for generating weighted control points, by means of which a control point structure comprising a limited number of pixels is formed around a control point of at least one of the image and ~~and/or of~~ the reference image; wherein the control point structure is mapped by the mapping function onto the ~~other~~ image serving as the image structure, ~~wherein~~ the quality of the control point structure ~~can be~~ is described measured by at least ~~in terms of~~ one of its variability,

directional contrast, ~~and~~ and/or similarity, and a weighting of the control points is determined on the basis of ~~this~~ said control point structure quality.

11. (currently amended) Device according to claim 10, comprising a module ~~by means of which the~~ for adjusting a position of the control point in at least one of the image and ~~and/or in~~ the reference image ~~can be adjusted~~,

wherein the form of a gray-scale distribution of the control point structure and the form of the gray-scale distribution of the image structure ~~can be adjusted to each other~~ are relatively adjustable on at least one channel, wherein at least one first difference between the gray-scale values of two adjacent pixels of the control point structure, and at least one second difference between the gray-scale values of the corresponding pixels of the image structure, are formed, wherein an error value is determined from a difference between ~~these two~~ said first and second differences, ~~an error is derived~~, wherein the a less-resolved image structure component is mapped onto ~~the~~ a more highly resolved image structure component, and wherein the control point structure in at least one of the image and ~~and/or in~~ the reference image are shifted in ~~the~~ at least one of a vertical and ~~and/or in the~~ a horizontal direction, to find the error value for ~~the~~ a new position.

12. (currently amended) Device according to claim 10 ~~or Claim 11~~, further comprising a module (7) for adjusting, ~~by means of which~~ the parameters of the mapping function ~~are adjusted~~, wherein the mapping function is changed by changing the parameters in such a way that ~~the~~ a cumulative error of the positional differences between the weighted control points and the associated projected image points is minimized ~~under consideration of the weighting of the control points~~.

13. (currently amended) Device according to ~~one of Claims 9-12~~ claim 9, further comprising a module (8) for performing, ~~by means of which~~ a compensating calculation ~~can be carried out~~, wherein, ~~for each control point~~, for determining at least one correction value in ~~the~~ a vertical direction and one correction value in ~~the~~ a horizontal direction ~~can be determined~~, ~~which~~ the correction values ~~embody~~ correcting the deviation of the value of the

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mapping function from the value of the compensating function at the location of the control point.

14. (currently amended) Device according to ~~one of Claims 9-13~~ claim 9, further comprising a module (9) for mapping, ~~by means of which~~ the corner coordinates of an image element ~~can be mapped~~ onto image positions, wherein the image positions of the corner coordinates ~~can be~~ are determined ~~on the basis of~~ from the mapping function and the correction function.

15. (currently amended) Device according to ~~one of Claims 9-14~~ claim 9, further comprising a module (10) for performing, ~~by means of which~~ a resampling ~~can be performed~~, wherein the corner coordinates ~~mark out~~ describe a polygon, ~~preferably a rectangle~~, and the wherein gray-scale values determine the a final gray-scale value ~~in~~ from a correspondence with the a percentage of areas of all the image elements ~~lying~~ within the said polygon.

16. (currently amended) Device according to ~~one of Claims 9-15~~ claim 9, ~~characterized in that the~~ wherein said extraction module (1) includes means for performing at least one of a classification ~~and/or a module (2) for~~ a geometric structure analysis, wherein in the said classification process, the properties of the image ~~can be~~ are analyzed and the at least one of objects and ~~and/or~~ areas of the ~~same~~ like class membership are formed; and

in the said geometric structure analysis includes the at least one of determining an edge contour of an object ~~can be found~~ from the an edge contour of an area and ~~and/or an object can be numerically characterized~~ characterizing an object by a structure index.

17. (new) The process according to claim 7, wherein said polygon is a rectangle.

18. (new) The device according to claim 15, wherein said polygon is a rectangle.

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Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 1. This sheet, which includes Fig. 1, 4, and 5, replaces the original sheet including Figs. 1, 4, and 5. Fig. 1 is amended to replace the German language labels with English language labels.

Attachment: Replacement Sheet